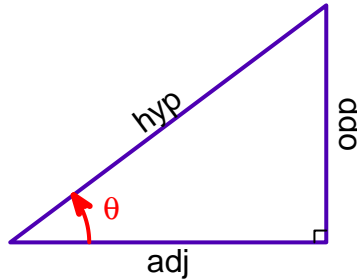


## Right-triangle trigonometry cheat sheet



### SOHCAHTOA

$$\sin(\theta) = \frac{\text{opp}}{\text{hyp}} \quad \text{opp} = \text{hyp} \cdot \sin(\theta) \quad \text{hyp} = \frac{\text{opp}}{\sin(\theta)} \quad \theta = \arcsin\left(\frac{\text{opp}}{\text{hyp}}\right)$$

$$\cos(\theta) = \frac{\text{adj}}{\text{hyp}} \quad \text{adj} = \text{hyp} \cdot \cos(\theta) \quad \text{hyp} = \frac{\text{adj}}{\cos(\theta)} \quad \theta = \arccos\left(\frac{\text{adj}}{\text{hyp}}\right)$$

$$\tan(\theta) = \frac{\text{opp}}{\text{adj}} \quad \text{opp} = \text{adj} \cdot \tan(\theta) \quad \text{adj} = \frac{\text{opp}}{\tan(\theta)} \quad \theta = \arctan\left(\frac{\text{opp}}{\text{adj}}\right)$$

### Tangent Identity

$$\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$$

### Pythagorean Identities

$$\text{adj}^2 + \text{opp}^2 = \text{hyp}^2 \quad \text{hyp} = \sqrt{\text{adj}^2 + \text{opp}^2} \quad \text{adj} = \sqrt{\text{hyp}^2 - \text{opp}^2} \quad \text{opp} = \sqrt{\text{hyp}^2 - \text{adj}^2}$$

$$\sin^2(\theta) + \cos^2(\theta) = 1 \quad \sin(\theta) = \sqrt{1 - \cos^2(\theta)} \quad \cos(\theta) = \sqrt{1 - \sin^2(\theta)}$$

$$\tan^2(\theta) + 1 = \frac{1}{\cos^2(\theta)} \quad \tan(\theta) = \sqrt{\frac{1 - \cos^2(\theta)}{\cos^2(\theta)}} \quad \cos(\theta) = \sqrt{\frac{1}{\tan^2(\theta) + 1}}$$

$$\tan^2(\theta) + 1 = \frac{1}{1 - \sin^2(\theta)} \quad \tan(\theta) = \sqrt{\frac{\sin^2(\theta)}{1 - \sin^2(\theta)}} \quad \sin(\theta) = \sqrt{\frac{\tan^2(\theta)}{\tan^2(\theta) + 1}}$$